

REMARKS

Summary of the Office Action

Claims 1-13 and 25-35 are pending in the above-identified patent application.

A substitute specification was requested pursuant to 37 C.F.R. § 1.125(a).

Claims 7, 26, 27, and 30-35 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

Claims 1, 5-7, 9, 28, and 29 were rejected under 35 U.S.C. § 102(b) as being anticipated by Evenson et al. U.S. Patent No. 5,439,310 ("Evenson"). Claims 1, 8, 10, and 25 were rejected under 35 U.S.C. § 102(b) as being anticipated by Minogue U.S. Patent No. 4,169,308 ("Minogue"). Claims 2-4, 11, and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Evenson. Claims 12 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Minogue in view of Bricker U.S. Patent No. 4,583,432.

Summary of Applicant's Reply

Applicant has amended claims 1 and 29 to more particularly define the present invention. Applicant has amended claims 8 and 25-27 to conform to the amendments to claims 1 and 29. Claim 10 has been amended to correct a clerical error. Claims 26, 27, 30, 31, and 33-35 have been amended to correct dependencies. Claims 7, 11, and 32 have been cancelled without prejudice.

A substitute specification is being filed concurrently herewith to address the Examiner's request pursuant to 37 C.F.R. § 1.125(a). A Petition for a three-month extension of time is also being filed concurrently herewith.

The Examiner's claim rejections under sections 102 and 103 are respectfully traversed.

Substitute Specification

A substitute specification is being filed concurrently herewith to address the Examiner's request pursuant to 37 C.F.R. § 1.125(a). Both clean and marked-up versions of the substitute specification are provided. The substitute specification provided herewith shows applicant's amendments to the specification set forth in the Preliminary Amendment originally filed with the Patent and Trademark Office ("PTO") on September 17, 2003, and re-filed with the PTO on February 7, 2004. In accordance with 37 C.F.R. § 1.125(b), the substitute specification submitted herewith includes no new matter.

The Section 112 Rejections

Claims 7, 26, 27, and 30-35 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicant has cancelled claims 7 and 32 without prejudice. Claims 26, 27, 30, 31, and 33-35 have been amended to correct dependencies. Accordingly, the Examiner's rejection of the claims under section 112, second paragraph, should be withdrawn.

The Section 102 and 103 Rejections

Claims 1 and 29

Applicant's amended claim 1 is directed to a jiggling device for maintaining a first element in a spatial relationship to a second element, and applicant's amended claim 29 is directed to a method for maintaining a first element in a spatial relationship to a second element. Claims 1 and 29 have been amended to further define that the first fastening means has two separate parts that can be coupled together: "*a first part* for connection to the first element and including first coupling means," and "*a second part* including adjustment means for adjusting the

spatial relationship between the first and second elements, the second part also including second coupling means for engagement with the first coupling means" (emphasis added). As set forth in claims 1 and 29, the first and second coupling means are separate from the adjustment means of the second part.

The first fastening means can be locked to the second fastening means, thereby locking the first element to the second element, using a locking means: "the locking means in the locked position being located within a portion of the second part of the first fastening means received within the second fastening means and adapted to press the received portion of the second part of the first fastening means outwardly against the second fastening means."

Evenson

The Examiner has rejected claims 1 and 29 as being anticipated by Evenson. Evenson discloses a releasable coupling device for connecting two members to one another. The device of Evenson connects members 36 and 60 to one another using collet mechanism 30 and receptacle 34 (FIG. 3). Collet fingers 76 are actuated by actuator head 80 to latch fingers 76 into recess 48 of socket extension 44, resulting in a connection between members 36 and 60.

Applicant's claims 1 and 29 have been amended to further define that the first fastening means includes two separate parts that are coupled together via first and second coupling means. Evenson, in contrast, discloses collet mechanism 30 and receptacle 34, neither of which include two separate parts coupled together via coupling means. Accordingly, Evenson fails to disclose or suggest at least "a first fastening means having two separate parts," as set forth in applicant's amended claims 1 and 29.

Further, applicant's claim 1 and 29 set forth that the first element can be locked to the second element using a locking means: "the locking means in the locked position being located

within a portion of the second part of the first fastening means received within the second fastening means and adapted to press the received portion of the second part of the first fastening means outwardly against the second fastening means." In Evenson, in contrast, the portion of the device that latches collet fingers 76 into recess 48 is actuator head 80, which is located within collet mechanism 30 and *not* receptacle 34. Accordingly, Evenson fails to disclose or suggest at least "[a] locking means in the locked position being located within a portion of the second part of the first fastening means received within the second fastening means and adapted to press the received portion of the second part of the first fastening means outwardly against the second fastening means," as set forth in applicant's amended claims 1 and 29.

Thus, for at least these reasons, applicant's amended claims 1 and 29 are not anticipated by Evenson, and the rejection should be withdrawn.

Minogue

The Examiner has rejected claims 1 and 29 as being anticipated by Minogue. Minogue discloses a sign mounting method for mounting a sign B to a sign support C using male member 20 and female member 40 (FIG. 1A). Male member 20 includes a threaded boss 24 for engagement with threads 43 of female member 40, resulting in a connection between sign B and sign support C.

Applicant's claims 1 and 29 have been amended to further define that the first fastening means includes two separate parts that are coupled together via first and second coupling means. Minogue, in contrast, discloses male member 20 and female member 40, neither of which include two separate parts coupled together via coupling means. Accordingly, Minogue fails to disclose or suggest at least "a first fastening means having two separate parts" as set forth in applicant's amended claims 1 and 29.

Further, applicant's claim 1 and 29 set forth that the first element can be locked to the second element using a locking means. Specifically, claims 1 and 29 recite "the locking means in the locked position being located within a portion of the second part of the first fastening means received within the second fastening means and adapted to press the received portion of the second part of the first fastening means outwardly against the second fastening means." In Minogue, in contrast, no such locking means is provided. In particular, male member 20 engages female member 40 by the insertion of threaded boss 24 into threaded portion 43. In this engagement, boss 24 is not pressed outwardly against threaded portion 43; rather, boss 24 and portion 43 are "locked" via the engagement of the threads. Accordingly, Minogue fails to disclose or suggest at least "[a] locking means in the locked position being located within a portion of the second part of the first fastening means received within the second fastening means and adapted to press the received portion of the second part of the first fastening means outwardly against the second fastening means," as set forth in applicant's amended claims 1 and 29.

Thus, for at least these reasons, applicant's amended claims 1 and 29 are not anticipated by Minogue, and the rejection should be withdrawn.

Furthermore, the Examiner has variously rejected dependent claims 2-6, 8-10, 12, 13, and 25 under sections 102 and 103. However, because independent claims 1 and 29 are allowable at least for the reasons provided hereinabove, these dependent claims are also allowable, and the Examiner's rejections of the claims are therefore moot.

Conclusion

Applicant respectfully submits that, as described above, the cited prior art does not show or suggest the combination of features recited in the claims. Applicant does not concede that the

cited prior art shows any of the elements recited in the claims. However, applicant has provided specific examples of elements in the claims that are clearly not present in the cited prior art.

In addition, each of the combination of limitations recited in the claims includes additional limitations not shown or suggested by the prior art. Therefore, for these reasons as well, applicant respectfully requests withdrawal of the rejection.

Further, there is no motivation shown to combine the prior art cited by the Examiner, and even if these teachings of the prior art are combined, the combination of elements of claims, when each is interpreted as a whole, is not disclosed in the Examiner's proposed combination. As the combination of elements in each of the claims is not disclosed, applicant respectfully requests that the Examiner withdraw the rejections.

Applicant strongly emphasizes that one reviewing the prosecution history should not interpret any of the examples applicant has described herein in connection with distinguishing over the prior art as limiting to those specific features in isolation. Rather, applicant asserts that it is the combination of elements recited in each of the claims, when each claim is interpreted as a whole, which is patentable. Applicant has emphasized certain features in the claims as clearly not present in the cited references, as discussed above. However, applicant does not concede that other features in the claims are found in the prior art. Rather, for the sake of simplicity, applicant is providing examples of why the claims described above are distinguishable over the cited prior art.

Applicant wishes to clarify for the record, if necessary, that the claims have been amended to expedite prosecution. Moreover, applicant reserves the right to pursue the original subject matter recited in the present claims in a continuation application.

Any narrowing amendments made to the claims in the present response is not to be construed as a surrender of any subject matter between the original claims and the present claims; rather merely applicant's best attempt at providing one or more definitions of what the applicant believes to be suitable patent protection. In addition, the present claims provide the intended scope of protection that applicant is seeking for this application. Therefore, no estoppel should be presumed, and applicant's claims are intended to include a scope of protection under the Doctrine of Equivalents.

Further, applicant hereby retracts any arguments and/or statements made during prosecution that were rejected by the Examiner during prosecution and/or that were unnecessary to obtain allowance, and only maintains the arguments that persuaded the Examiner with respect to the allowability of the patent claims, as one of ordinary skill would understand from a review of the prosecution history. That is, applicant specifically retracts statements that one of ordinary skill would recognize from reading the file history were not necessary, not used and/or were rejected by the Examiner in allowing the patent application.

For all the reasons advanced above, applicant respectfully submits that the rejections have been overcome and should be withdrawn.

For all the reasons advanced above, applicant respectfully submits that the application is in condition for allowance, and that such action is earnestly solicited.

Authorization


The Director is hereby authorized to charge any additional fees which may be required for this Reply, or credit any overpayment, to Deposit Account No. 08-0219.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Director is requested to grant a petition

for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. 08-0219.

Respectfully submitted,
Wilmer Cutler Pickering
Hale and Dorr LLP

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Victor F. Souto
Registration No. 33,458
Attorney for Applicant

Wilmer Cutler Pickering
Hale and Dorr LLP
Customer No. 28089
399 Park Avenue
New York, New York 10022
Tel: 212-230-8800
Fax: 212-230-8888

Internal Jigging

Related Application

This application is a continuation of International Application No. PCT/AU02/00322, filed March 20, 2002, which was published under PCT Article 21(2) in English and is incorporated
5 herein by reference. International Application No. PCT/AU02/00322 claims priority from
Australian Patent Application No. PR 3851, filed March 20, 2001, which is also incorporated
herein by reference.

Technical Field

This invention relates to jigs and jigging devices. In particular this invention relates to
10 jigging devices which may be regarded as internal and permanent compared to known jigging
arrangements.

The invention also relates to a novel method of jigging.

Background Art

Jigs and jigging devices are generally well known and widely used in manufacture.
15 Typically, a jig will have various reference surfaces and/or points to permit accurate
alignment of parts or tools. It is common to jig parts during many manufacturing processes,
so that the parts are held in correct juxtaposition during such processes as punching, riveting,
welding, gluing or curing. Jigs are regarded as an essential part of the manufacturing process
and represent a significant part of the cost of manufacture as well as demanding logistical
20 consideration during production.

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Most jigging processes are carried out using jigs which are external to the object being formed. Such prior art jigging processes often require clamps, temporary braces or profiles
5 of the final form of the object.

Some of the problems presented by prior art jigging can be described, by way of example, in connection with the manufacture of steel-framed vehicles. In the manufacture of such vehicles, in this example the frame is tubular and panels for the vehicle are glued to the frame. During the adhesion process, it is necessary to adjust one panel relative to another and
10 to hold the panels in the correct position while the adhesive cures. In the past, this has been achieved by the use of external clamps, etc. There are drawbacks with the use of clamps, however. For example, clamps must be carefully removed and returned to the panel assembly station, complicating production line issues. Often, damage is caused to the panels due to the pressure required to hold the parts together. Clamps do not contribute to the final
15 assembly strength. In addition, their presence precludes painting and access to other production line issues, such as cabling.

In many instances, it is not possible to progress the vehicle along an assembly line until the adhesive has cured. This results in inefficiency in the manufacturing process, with a costly time delay and/or the need for multiple adhesive stations.

20 **Disclosure of the Invention**

It is an aim of the present invention to provide a jigging device and a method of jigging which, at least in some embodiments, can allow parts to be positioned using internal, not external, means. It is a further aim of this invention, in some embodiments, to enable automated and programmed tolerance control during the pre-assembly process. It is a further
5 aim to provide jigging which need not be removed, so that assembly line procedures can continue uninterrupted.

Accordingly, this invention provides a jigging device for maintaining a first element in spatial relationship to a second element, the device including a first fastening means for connection to the first element and a second fastening means for connection to the second element, at
10 least one of the first and second fastening means including adjustment means for adjusting the spatial relationship between the first and second elements, characterized in that the first fastening means has a portion adapted for receipt in a portion of the second fastening means, the device also including locking means adapted to ~~lock~~ assume a position in which the first fastening means is locked to the second fastening means, the locking means in the locked
15 position being located within the portion of the first fastening means received within the portion of the second fastening means and adapted to press the received portion of the first fastening means outwardly against the receiving portion of the second fastening means.

The invention also includes a jigging method for maintaining a first element in spatial relationship to a second element, the method including the steps of:

- 20 (1) connecting a first fastening means to the first element;
- (2) connecting a second fastening means to the second element;

(3) adjusting the spatial relationship of the first element to the second element via adjustment means; and

(4) ~~locking~~ inserting a portion of the first fastening means ~~to~~ in a portion of the second fastening means[.]; and

5 (5) causing a locking means to move to a position within the first fastening means where the locking means presses outwardly against the portion of the first fastening means inserted in the second fastening means, thus locking the first fastening means to the second fastening means.

Preferably, step [(4)] (5) is followed by step [(5)] (6) in which the first element is
10 connected to the second element via adhesion, welding or a similar manufacturing process.

It is to be understood that in the jiggling method of the invention, the steps can be carried out in an order different from that set out above. By way of example, step (2) can be carried out after step (3).

The first element and the second element can be chosen from a wide variety of options. By
15 way of example, in the manufacture of framed vehicles, the first element may be part of a tubular frame for the vehicle, while the second element may be a panel. Using the jiggling device or method of the invention, the panel may be adjusted in any desired spatial relationship to the frame. For example, the panel may be adjusted to be closer to or further away from the frame. The panel may be adjusted so as to be closer to or further away from
20 an adjacent panel.

The first and second fastening means and the adjustment means may similarly be chosen from a wide variety of options, as can the locking means. While it is to be understood that the first and second fastening means, the adjustment means and/or the locking means may be manipulated manually or presented in a relatively unsophisticated form, it is preferred that the locking means, at least, can be activated, to be locked or unlocked, remotely. In this regard, the contents of international patent application No. PCT/AU99/00185 are imported herein by reference. This specification discloses various forms of locking means and remote activation for such locking means and adjustment means.

It is an option with the jigging device and method of the invention that the adjustment means may be associated more with one fastening means than the other. It is a further option that a first adjustment means is associated with the first fastening means and a second adjustment means is associated with the second fastening means, enhancing the ways in which the spatial relationship can be changed.

Using the jigging device and method of the invention, it is possible to adjust one element such as a panel in an exact spatial relationship with a second element such as a steel frame, release the first element from the second element and relocate the same panel or a substitute panel (if the first panel is damaged) in the exactly required location on the frame. Further, it is possible, after the respective elements have been located in the correct position, to remove one of the elements, apply adhesive and replace that element, once again in the exact required location. In this embodiment, the jigging device of the invention will hold the first element in the correct location with respect to the second element while the adhesive cures.

The fastening means may be connected to the element in any desired way, including by using adhesive, by using a collar into which the fastening means can be fitted, by using double-sided tape (of suitable peel strength), by otherwise attaching the first fastening means to the element, or by moulding or forming the fastening means in or on the element.

- 5 The adjustment means may provide adjustment in any desired manner. By way of example, the adjustment means may have a series of serrations or a screw thread, in each case adapted to be received in a complementary shape. By way of further example, the adjustment means may have first and second parts, one being able to slide into the other to permit adjustment.

- While the jigging device of the invention can incorporate locking means working along the same principle as the fastening and release systems of international patent application No. PCT/AU99/00185, it is a further option that the jigging device of the invention may be "intelligent" -namely, the jigging device may possess means which enables automated adjustment of the first element relative to the second element. By way of example, the intelligent means may be capable of sensing an undesirable gap between adjacent panels and
10 of automatically activating the adjustment means to close the gap so that it falls within a preset tolerance. In this way, panels, etc, can become self-adjusting.

- It is also to be understood that the jigging device and method of the invention can be used in different ways. The jigging device can be used to temporarily fasten one element to another, while enabling the accurate positioning of the elements. Once the correct position of the elements has been achieved, one element can be locked to the other by use of the jigging
20 device of the invention. Optionally, the jigging device can permit disassembly of the elements while potentially maintaining the correct setting. On this basis, when the elements

are assembled again, they immediately are located in the correct, predetermined, relative position.

Brief Description of the Drawings

The invention will now be described in relation to certain non-limiting embodiments

5 illustrated in the attached drawings, in which:

Figures 1 to 3 illustrate, in cross-sectional view, a first embodiment of the jiggling device and method of the invention;

Figures 4 to 9 illustrate in more detail and in magnified view some of the parts of the embodiment shown in Figures 1 to 3;

10 Figures 10 to 13 illustrate in cross-sectional view a second embodiment of the jiggling device and method of the invention;

Figure 14 is a magnified view of the second embodiment;

Figures 15 and 16 show the second embodiment in longitudinal cross-sectional view;

Figure 17 is a top view of the second embodiment;

15 Figure 18 is a side elevation of the second embodiment;

Figures 19 to 22 show in cross-sectional view a third embodiment of the jiggling device and method of the invention;

Figure 23 is a close-up view of Figure 21;

Figure 24 is a magnified view of the third embodiment;

Figures 25 and 26 show the third embodiment in longitudinal cross-sectional view;

Figure 27 shows a top view of the third embodiment; and

Figure 28 shows a side elevation of the third embodiment.

5 **Detailed Description**

Figures 1 to 3 show a first element (panel 10) being maintained in a spatial relationship with a second element (tubular steel frame 12). Figure 1 shows fastener insert 14 inserted in an opening 16 provided for the purpose in tubular steel frame 12. As can be seen from Figure 2, fastener insert 14 together with adjustable capsule 18 make up the second fastening means.

- 10 The first fastening means comprises panel fastener 20 which is shown in Figure 2 attached (for example, by glue) to panel 10.

As can be seen from Figure 3, after adjustable capsule 18 is adjusted in the desired way within fastener insert 14, panel fastener 20 can be attached to adjustable capsule 18 and locked in place by locking pin 22.

- 15 Adjustable capsule 18 is shown in more detail in Figures 4 to 8, while panel fastener 20 is shown in close-up view in Figure 9. As can be seen from Figures 4 and 5, adjustable capsule 18 has a series of serrations 24 and a locking rim 26 and includes keeper 28.

Figure 8 is a cross-sectional view taken along the lines 8-8 of Figure 4, while Figure 7 is a cross-sectional view taken along the lines 7-7 of Figure 5. As well as keeper 28, the

adjustable capsule 18 includes keeper 30. Locking pin 22 is shown located in the region of keeper 28.

A top view of adjustable capsule 18, as shown in Figure 5, can be seen in Figure 6.

With reference to Figure 8, walls 32 of adjustable capsule 18 are capable of flexing inwardly
5 where not prevented by locking pin 22.

Panel fastener 20, shown in Figure 9, includes ridged cylindrical wall 34 and a further keeper 36.

To operate this first embodiment, fastener insert 14 is positioned within tubular steel frame 12, preferably by adhesion. Adjustable capsule 18 is placed within fastener insert 14, with
10 locking pin 22 in the position shown in Figure 2. Panel fastener 20 is attached to panel 10, once again, preferably by adhesion. Adjustable capsule 18 is adjusted with reference to fastener insert 14 so that, when panel fastener 20 is attached, panel 10 will be at the required distance from tubular steel frame 12. Panel fastener 20 is then attached to adjustable capsule 18 by a push fit, rigid cylindrical wall 34 causing flexible wall 32 to flex inwardly so that
15 locking rim 26 is located in notch 38 (see Figure 9) of panel fastener 20. Locking pin 22 is caused to move upwardly until it contacts keeper 36 as shown in Figure 3. In this position, locking pin 22 maintains locking rim 26 in notch 38 and effectively locks panel fastener 20 to adjustable capsule 18, thus also maintaining panel 10 in the desired relationship to tubular steel frame 12. Locking pin 22 can be caused to move by any desired means, preferably
20 remote, such as by use of a radio, magnetic or electronic signal or in any other suitable manner, such as is described in international patent application No. PCT/AU99/00185.

Referring now to Figures 10 to 14, once again fastener insert 14 is shown inserted in tubular steel frame 12 (Figure 10). However, in this embodiment the first element is panel 10, while the second element is frame 12. Adjustable plate 40 having neck 42 is positioned within fastener insert 14. Locking pin 44 is at this stage in the unlocked position (refer to Figures 11 and 12). Panel plate 46 having locking pins 48 is then inserted in position on adjustable plate 40, which is adjusted as to the correct height for the relationship between panel 10 and tubular steel frame 12 (Figure 12). Once the correct height has been adjusted, adjustable plate 40 is locked into place within fastener insert 14 by causing locking pin 44 to abut keeper 50, as shown in Figure 13. Panel plate 46 is removed from adjustable plate 40, adhered to panel 12 and then reinserted in adjustable plate 40. If desired, locking pins 48 can be caused to lock panel plate 46 into position. As a further option, adhesive may now be inserted generally between panel 10 and tubular steel frame 12. This is further illustrated in Figures 15 and 16, which are a longitudinal cross-section taken at right angles to the views in Figures 10 to 14.

Figure 14 shows in close-up view fastener insert 14, adjustable plate 40 and panel plate 46. As is the case in the first embodiment (for example in Figure 1), fastener insert 14 includes internal serrations 52. Channel 54 is for location of tubular steel frame 12. Adjustable plate 40 has serrations 24 complementing internal serrations 52 on fastener insert 14. Keeper 50 maintains the legs of neck 42 in position. Adjustable plate 40 also includes resilient legs 56 and spacing legs 58. Resilient legs 56 are designed to lock legs 60 on panel plate 46 in channels 62. Panel plate 46, which is attached by adhesive 64 to panel 10 in Figure 13, includes locking pins 48 having keepers 66 and 68. Adjustable plate 40 is locked to tubular steel frame 12 by causing locking pin 44 to travel downwardly to abut keeper 50, as shown in

Figure 13. Panel plate 46 is locked to adjustable plate 40 by causing locking pins 48 to move downwardly from the position shown in Figure 11 to that in Figure 12, for example. As before, the locking of locking pins 44 and 48 is optionally reversible by use of remote activation means.

5 As seen from Figures 15 and 16, a large quantity of adhesive 70 can be deposited on tubular steel frame 12 after panel plate 46 is unlocked from adjustable plate 40 for this purpose. Panel plate 46 is then locked into position in adjustable plate 40 to maintain the desired spatial relationship between panel 10 and tubular steel frame 12 while adhesive 70 cures (refer Figure 16).

10 A top view of the second embodiment is shown in Figure 17 and a side elevation in Figure 18.

The third embodiment is shown in Figures 19 to 28. This embodiment is similar to the previous embodiment and like parts will be labelled with like numbers. However, whereas the previous embodiment showed a double fastener via locking pins 48 in panel plate 46, the

15 present embodiment has a single fastener with two locking pins.

As before, fastener insert 14 is positioned within tubular steel frame 12 as in Figure 19 and neck 42 is adjusted in position using locking pin 44. After panel 10 has been adhered to panel fastener 72, panel 10 is checked for correct positioning in relation to tubular steel frame 12, as in Figure 21. Panel fastener 72 is then released from adjustable plate 40, as in Figure

20 22 and Figure 25. Adhesive 70 is deposited on tubular steel frame 12 and panel 10 and panel fastener 72 replaced and locked into position as shown in Figure 26.

Figure 27 shows this embodiment in top view and Figure 28 shows it in side elevation. It will be appreciated that Figure 26 is a longitudinal sectional view taken along the lines A-A of Figure 27, while Figure 23 is a cross-sectional view taken along the lines B-B of Figure 28.

- 5 The detail of this embodiment can be seen from Figure 24, which includes keepers 74, 76 and 78 as well as locking pins 80.

It will be appreciated by one skilled in the art that various changes may be made to the embodiments described and that other modifications may be effected without departing from the spirit and scope of the invention. For example, it is within the scope of the invention to
10 have the adjustment means on the fastening means attached to the panel rather than to the tubular steel frame, as illustrated. It is also within the scope of the invention to have adjustment means on both fastening means.

Industrial Applicability

- The invention represents an important advance in jiggling arrangements and is capable of
15 making assembly line production far more accurate and efficient, while at the same time greatly reducing costs.